PLATE L.

Fig. 25. Caudal fin of *Gobius paganellus*. Note the large amount of cartilage entering into the skeleton.
26. Caudal fin of *Callionymus lyra*. A very advanced form of homocercy with no complications.
27. Caudal fin of *Scorpæna scrofa*. Intermediate between a lowly and a highly specialized homocercal caudal.
28. Caudal fin of *Trigla lineata*. Figure drawn from a cleared specimen, showing well the vestige of a urostyle.
29. Caudal fin of *Cristiceps argentatus*.
30. Caudal fin of *Ophidium barbatum*. The caudal proper is confined to the rays attached to the terminal hypural bone. Note the cartilaginous shaft fused to the posterior side of the neural and hæmal arches of the penultimate vertebra. The median fins form a continuous series.
31. Caudal fin of *Mastacembelus* sp.? Forms part of continuous median fin, but the caudal proper is wholly hypaxial.
32. Caudal fin of *Lophius piscatorius*. The extreme case of advanced homocercy—a totally hypaxial fin.
33. Caudal fin of *Balistes capriscus*.

## 2. Some Notes on Tasmanian Frogs.

By T. M. SAVAGE ENGLISH*.

[Received March 10, 1910.]

(Plate LI.†)

Taking into consideration its outlying position and its comparatively small size, Tasmania is the home of a surprisingly large number of frogs.

Seven species have come under my own observation, and it is about these that the following notes were made in the years 1901–3. These species, all of which, I believe, are also found in the neighbouring State of Victoria, are :—

1. *Limnodynastes tasmaniensis.*
2. *Limnodynastes dorsalis.*
3. *Crinia signifera.*
4. *Crinia lævis.*
5. *Pseudophryne bibronii.*
6. *Hyla ewingii.*
7. *Hyla aurea.*

No others than these seven have come under the notice of Mr. J. J. Fletcher (Proceedings of the Linnean Society of N. S. W. 1897, p. 662). He and others, including myself, have tried in vain to find *Crinia tasmaniensis*, and Mr. Boulenger considers that, though this is beyond doubt a well-marked species, there is reason for thinking that the specimens of it which have belonged to the British Museum since 1858 may not have come from Tasmania.

* Communicated by G. A. BOULENGER, F.R.S., V.P.Z.S.
† For explanation of the Plate see p. 634.

Two other frogs, *Limnodynastes peronii* and *Hyla peronii*, have been credited to Tasmania, in both cases on the strength of single specimens presented to the British Museum by Sir A. Smith before 1858. Here, again, the evidence of locality seems doubtful. But in a mountainous and forest-clad country, frogs, however abundant they may be, are difficult to find, and it is only a small portion of Tasmania that has been explored for them at all; so that it is quite possible that these and perhaps other species may exist.

The Tasmanian climate is on the whole mild and even, with regular seasons. Its winter resembles that experienced in the south of Europe, though the mean temperature of summer is not higher in Tasmania than it is in the north of France. The rainfall is distributed over the year, and the droughts of the Australian mainland are unknown.

This climate allows the frogs of Tasmania to breed at almost any time; so that it is nearly always possible to find tadpoles in any suitable pond. But each species seems on the whole to keep to its own particular season.

Taking the species in order :—

1. Limnodynastes tasmaniensis. (Plate LI. figs. 1, 2.)

I found this frog abundantly in the neighbourhood of Hobart in the south-east, and towards the north, around Launceston and Westbury. These places have a smaller rainfall than the average for the island. On the north-west coast, where, at Ulverstone and Devonport, there is sufficient rain for tree-ferns near sea-level, I did not find it.

The stone, or log, under which it makes its home during the day, is usually in a somewhat moist place, but *Limnodynastes tasmaniensis* is decidedly terrestrial in its habits. I never found a single individual in the water, and if thrown in it at once makes for the bank, swimming badly.

A well marked specimen of this frog is a really beautiful creature: light brown inclining to yellow, or occasionally pink, with large and regularly placed spots, which may be either rich dark brown or green, with or without a lighter edging. From this coloration it may vary to an almost uniform dark brown, sometimes looking almost black. The dorsal stripe is generally bright yellow.

I found one at Westbury, towards the end of summer (February 1902), whose dorsal stripe was of a brilliant orange, almost red (*cf.* colour variations of *Hyla ewingii* and *Crinia signifera* from the same place).

I was not able to determine satisfactorily the note of *Limnodynastes tasmaniensis*, though a noise like two stones being sharply struck together, which I repeatedly heard from a heap of loose rock on the bank of the North Esk, near Launceston, in April, 1901, must have come from either this species or *Hyla aurea*. Numbers of both were under the stones, but no other frogs.

2. Limnodynastes dorsalis. (Plate LI. fig. 3.)

Of this species, which is widely distributed over the mainland of Australia, and is probably common in most parts of Tasmania, I only secured one adult specimen. This I found at the end of a burrow in sand under a large stone. It was in a rather dry part of some Eucalyptus "bush," but not far from a small pond.

If I am right in supposing that a loud booming note, which can be heard considerably more than a quarter of a mile away, is due to this species, it is common in the neighbourhood of Hobart, Launceston, Fingal (in the east of the island), and on the north-west coast.

The only other frogs to which this note could be reasonably attributed would appear to be *Limnodynastes tasmaniensis* and *Hyla aurea*; but the former does not seem to occur on the north-west coast, and the latter is not found near Hobart.

This is by far the most noticeable frog-music in Tasmania, and when, as is usually the case, a number of frogs are uplifting their voices together, the effect is that of a somewhat barbaric banjo performance. These concerts take place in or around some fairly deep pond, and, however quietly one approaches, according to my own experience, invariably cease before it is possible to exactly mark down the performers. I have never been able to notice any disturbance in the water, and believe that the frogs must be singing at the entrances of their burrows, and that these are well concealed under roots, stones, &c.

This frog, on the north-west coast, retired for the winter of 1902 about the middle of April, and was in evidence again towards the end of August.

At Ulverstone it was spawning towards the end of October, the egg-masses resembling lumps of froth about 6 inches, or rather less, across. On the 7th of November some of these had fairly large tadpoles in and under them. These tadpoles were very dark in colour, with violet reflections.

Earlier in the year (September) I had found some very large tadpoles of this species (3 inches long), with hind legs just forming, and at the same time some quite small ones. On the 10th of November some of these were showing signs of front legs, and by December they had become frogs.

3. Crinia signifera. (Plate LI. figs. 4, 5.)

This active and variable little frog was very common wherever I went in Tasmania, and its cricket-like chirp was to be heard at almost any time of the year; so that it does not seem to hibernate. It is decidedly aquatic, diving to the bottom at the slightest alarm and remaining motionless.

No kind of water seems to come amiss to it, from a rapid mountain stream to a muddy puddle. As a rule, however, it prefers water which is fairly shallow, and so is often obliged to become terrestrial during the heat of summer, when all the

shallow pools are dry. At this time of the year these frogs are to be found, almost always singly, under stones and in cracks in the ground, into which their small size allows them to go deep enough to find a secure and comparatively moist retreat.

They chirp to each other incessantly, by day as well as in the evening, and though the note of a single one is comparatively weak the combined efforts of the numbers which gather together in any suitable place can be heard a long way off.

On land these frogs are as active as crickets, and exceedingly difficult to catch. In the water they swim well.

The colour of *Crinia signifera* is as a rule dark brown or grey, but it is most variable. The male is darker than the female and may be almost black all over, though he is generally lighter underneath. The under surface of the female is usually white, with or without dark spots. While breeding, the male seems always to have a black throat. There is sometimes a tendency to bright brown or orange markings; and in February, 1902, I found one of these frogs at Westbury which was of a fairly bright orange all over (*cf.* colour variations of *Limnodynastes tasmaniensis* and of *Hyla ewingii* from the same place). The young and also the tadpoles are intensely black.

In January, 1901, I found that most of these frogs at Hobart, and at Zeehan in the west of the island, had the backs of their thighs and their hinder parts blood-red, giving them a truly diabolical appearance. I did not, however, find any of them coloured in this way except on these two occasions.

This species has a continued chirp, hardly to be distinguished from that of the mole cricket, which is such a common Tasmanian insect, or from that of *Pseudophryne bibronii*.

*Crinia signifera* has its main spawning season during the autumn and winter months, from May to August. At this time of the year these frogs are not nearly so active as usual, though of course this may be owing to the colder weather.

The male clasps the female round the waist.

The eggs are in masses, spread over stones and weeds at the bottom of shallow water, and the tadpoles are exceedingly small, as are the young frogs. These, at first, are less than a quarter of an inch in length.

4. Crinia lævis. (Plate LI. fig. 6.)

I found this species abundantly on the north-west coast; also, when I had got to know where to look for it, at Westbury and near Launceston. But as it seems to be not only nocturnal but silent, it is very possibly far more common than it appears to be.

All my specimens were under logs or stones lying on swampy or at all events fairly moist ground, but, in complete contrast to *Crinia signifera*, *Crinia lævis* appears to be altogether terrestrial, not even going into the water to spawn. Indeed, in life-history and habits these two frogs seem to have nothing in common, while *Crinia lævis* closely resembles *Pseudophryne bibronii*. It is

perhaps a little more active than this last, but still is by no means difficult to catch.

The colour of this species, in Northern Tasmania, does not seem to vary much. Above it is light grey, becoming paler or white underneath, where it is marbled with dark grey or black. The "concealed surface" at the groin is pink marbled with black. A breeding pair, near Devonport, had irregular brown blotches on their backs, while the throat of the larger of the two was dull yellow.

This frog may perhaps be responsible for some of the chirping which comes from the haunts of the smaller Tasmanian batrachians, but of this I was never able to assure myself.

Its breeding habits are peculiar. It does not deposit its eggs in water, but in a smooth-sided underground chamber, either hollowed out or adapted by the parent frogs.

On the 30th of March, 1902, one of these nests contained two frogs as well as a mass of eggs. (I never found more than two frogs of this species together: cf. *Pseudophryne bibronii*.) This mass, after being put into water, held together for about a week; then the eggs separated. The tadpoles began to free themselves on the 4th of May. Their colour during their earlier development was a rather pale brown, but before leaving the egg they became quite dark. There was no appearance whatever of external gills; and while in the eggs the tadpoles did not move at all.

5. Pseudophryne bibronii. (Plate LI. fig. 7.)

This little toad, the only known representative of the Bufonidæ in Tasmania, seems to be widely distributed over the island, for, though I never saw one of them except in the autumn, when they gather together for breeding, it was abundant wherever I happened to be at this time of the year: at Hobart, near Launceston, and near Devonport, in March, April, and May, 1901, near this last place in March and April, 1902, and at Perth in March, 1903.

After rain at the end of March, 1901, they became abundant and noisy near Launceston. I found over thirty packed closely together under one log.

This species is slow in its movements, and walks rather than hops. In the water it seems perfectly helpless, and as, like *Crinia lævis*, it leaves the necessary water for its tadpoles to be provided by subsequent rain, and frequents dry hilly country, it is probably, except for a short time as a tadpole, altogether terrestrial.

In colour it is dark brown above, occasionally almost black; beneath it is marbled, black and white or grey; while those parts of its legs which are usually concealed, except when it is walking, are brilliant yellow and orange. There are indications of a yellow vertebral stripe.

The note of *Pseudophryne bibronii* is a chirp, which I could not distinguish from that of *Crinia signifera*. As is the case with this last frog, the number of singers generally makes up for any

individual want of power, and the resulting concert can be fairly called noisy.

The breeding habits of the present species are to a large extent those of *Crinia lævis*, except that it is more social. I always found large companies gathered together under logs and stones in places where, after rain, ponds would form. They do not seem to make nests like *Crinia lævis*, but deposit their eggs under any convenient stone. (I never found any eggs under a log, but this of course may have been accidental.) The eggs do not seem to adhere either to each other or to anything else.

On the 20th of April, 1901, I found a collection of these eggs, which I put into water. The tadpoles began to wriggle at once, and within twelve hours they were free and swimming about.

6. Hyla ewingii. (Plate LI. figs. 8, 9.)

This frog seems to be abundant in most parts of Tasmania. The only place from which I might have recorded it, and did not do so, is Zeehan, and I am almost certain that this is an accidental omission.

It is on the whole aquatic, seldom going far from water, and living very generally under stones or logs on the bank of some pond or stream. When disturbed, it dives in with all speed.

It does not seem to be really arboreal, though it may occasionally climb up ten feet or so from the ground. I have never heard its note coming from the top of a tall tree, as one hears that of the European *Hyla arborea*, though this may perhaps be accounted for by the very slight shelter from either sun or enemies that a frog would find among the leaves of any full-grown Tasmanian Eucalyptus.

Where plants are kept in pots on a veranda a colony of these frogs usually settles, and its members seem to appreciate regular watering as much as the plants do, generally greeting it with song.

Except when breeding, *Hyla ewingii* is inactive during the day. Its regular concerts begin towards sunset, though, as is the case with many other frogs, its voice is heard when rain is approaching, or at times when certain loud noises excite it—rapid hammering, for instance.

It does not seem to hibernate, but is sluggish in cold weather.

Its colour is almost invariably some shade of brown, closely resembling that of its immediate surroundings.

Mr. J. J. Fletcher has found that near the summit of Mount Koskiusco, in New South Wales, frogs of this species are bright green. He attributes this to the fact that at this altitude, though the days may be warm, the nights are almost always frosty; so that no insects are abroad then, and the frogs have to hunt for food by day among green vegetation.

In January, 1902, I found a specimen at Westbury which had some bright green patches on its back. The colour of these patches seemed fixed; at all events it did not vary with that of the rest

of the frog according to its surroundings (*cf.* colour variations of *Limnodynastes tasmaniensis* and *Crinia signifera* from the same place).

The note of this frog resembles that of *Hyla arborea*, but is not so loud.

*Hyla ewingii* has its regular breeding season in winter. In July, 1902, it was spawning at both Launceston and Devonport, in pools and ditches such as would be chosen by *Rana temporaria*. Its spawn is in masses, very like those of this last frog but smaller. The first tadpoles appeared at the end of July. They are very small, and at first quite black, becoming paler and silvery underneath as they develop.

During November the pools they frequent in a normal season are fast drying up, and the water which remains is packed with tadpoles. Early in December these pools are mostly dry, and the tadpoles have either become frogs or perished, the place where the last water stood being covered by a layer of their dried-up bodies.

7. Hyla aurea.

This, the largest and most conspicuous of the Tasmanian frogs, seems to be decidedly local. I saw or heard of it only in the country drained by the North and South Esk rivers, which unite at Launceston to form the tidal Tamar, and by the Mersey, which falls into the sea at Devonport. There is only a low watershed between these two basins. Wherever it is found it seems to be abundant: near Launceston, Perth, Longford, Westbury, Fingal, and Devonport; and as it is diurnal, it is not likely to be overlooked if present.

In its habits it resembles *Rana esculenta*, being essentially aquatic, and in summer liking to sit in the sun near the water, into which it dives with a splash when alarmed. It is a powerful swimmer; its usual custom of returning at once to the bank after having dived in, can be well accounted for by the fact that the rivers it frequents all contain large trout. This frog seems to be impatient of cold. In 1902, at Devonport, it disappeared after a few frosty nights at the end of March and the beginning of April, though the weather was on the whole warm for quite six weeks after this. Near Launceston I found large numbers of these frogs under stones during April, 1901. I only once found one climbing; it had got about three feet from the ground in a bush.

A well-marked specimen of this species is most gorgeously coloured: green, gold, blue, and white; but from this it may vary to dull brown, and when about to retire for the winter to almost black.

Beyond an occasional and not very loud croak, I was never able to identify this frog's note, though for a considerable part of one summer my window overlooked a pond full of them.

I was not at any of the places which they frequent during their breeding-season: this is probably September or the beginning of

October. At Westbury, towards the end of January, 1902, tadpoles of this species were very abundant and were developing their hind legs. During February they became frogs.

These tadpoles are very fish-like in colour: greenish olive above, silvery white beneath. They make a most attractive spinning bait for large trout.

*Hyla aurea* is one of the many additions which have been made of late years to the fauna of New Zealand and to that of New Caledonia.

EXPLANATION OF PLATE LI.

Figs. 1 & 2. *Limnodynastes tasmaniensis*, showing different types of colouring.
Fig. 3. *Limnodynastes dorsalis*.
4. *Crinia signifera*, ♀ in the breeding season.
5. *Crinia signifera*, in late summer.
6. *Crinia lævis*.
7. *Pseudophryne bibronii*, with eggs showing the development of the tadpole.
8. *Hyla ewingii*, showing its normal colour.
9. *Hyla ewingii*, from a quarry of brightly coloured sandstone.

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April 19, 1910.

Dr. S. F. Harmer, M.A., F.R.S., Vice-President, in the Chair.

The Secretary read the following report on the additions made to the Society's Menagerie during the month of March 1910:—

The number of registered additions to the Society's Menagerie during the month of March last was 100. Of these 30 were acquired by presentation, 18 by purchase, 35 were received on deposit, 12 in exchange, and 5 were born in the Gardens.

The number of departures during the same period, by deaths and removals, was 190.

Amongst the additions special attention may be directed to:—

One Puma (*Felis concolor*) ♂, from Tucuman, presented by Alec S. Waley, Esq., on March 22nd.

Two Musquash (*Fiber zibethicus*), from North America, purchased on March 16th.

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*A new Monkey from the Malay Peninsula* *.

On behalf of Mr. Oldfield Thomas, F.R.S., F.Z.S., two specimens were exhibited of a new Monkey of the genus *Presbytis*, which had been obtained by Mr. H. C. Robinson during a recent expedition to the northern parts of the Malay States.

* Published by permission of the Trustees of the British Museum.

It was proposed to be called

PRESBYTIS ROBINSONI Thos. *

Abstract P. Z. S. 1910, p. 25 (April 26).

A white Monkey, with darker underside, hands, and feet. General colour above creamy white; the hairs white to their bases, mixed, however, with a small number of blackish hairs. These dark hairs became more numerous on the sides and belly, where they outnumbered the white ones; the general tone of the under surface grey, about grey no. 6 or 7 on the belly, darkening to no. 5 on the throat and sides of neck. Outer side of arms to wrists whitish like back, inner side and whole of legs with an equal mixture of dark and light hairs, resulting in about grey no. 9. Hands and feet greyish brown, with a tinge of bistre in it. Tail greyish white throughout.

Skin of face dark, except the lips, which were white. Long hairs of occiput directed forwards. Hairs of forehead radiating from points over the temples with a median crest between them, but both the whorls and crests differed considerably in the two specimens. Ear-tufts white, considerably surpassed by the long brownish hairs which grew from the lower parts of the cheeks.

A female specimen was whiter throughout, the under surface more nearly whitish, but still darker than the upper surface.

Dimensions of the type, measured in the flesh:—

Head and body 565 mm.; tail 824; hind foot 177; ear 30.

*Hab.* Ko-Khau, Trang, Northern Malay Peninsula.

*Type.* Adult male. British Museum, No. 10.10.1.1. No. 1236/10 of the Selangor Museum Register. Original number 3184. Obtained for Mr. Robinson by a native collector, 10 January, 1910.

This fine Monkey, which was obviously not an albino, differed conspicuously from all its allies by its white upper and darker lower surface, all other members of the group having the belly lighter than the back.

Mr. Thomas had great pleasure in naming it after its discoverer Mr. H. C. Robinson, Director of Museums, Federated Malay States, by whose scientific energy our knowledge of Malay Mammalia had been so largely increased.

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*A Collection of small Mammals from China* †.

On behalf of Mr. Oldfield Thomas, F.R.S., F.Z.S., a collection of small mammals obtained by Mr. Malcolm Anderson in Southern Shen-si for the Duke of Bedford's exploration of Eastern Asia was exhibited. Observations were made on the value of this further contribution by the Society's President to the National Collection

* The complete account of this new species appears here, but the name and a preliminary diagnosis were published in the 'Abstract,' No. 83, 1910.—EDITOR.

† Published by permission of the Trustees of the British Museum.

and on the resultant increase in our knowledge of geographical zoology, a subject in whose study the Zoological Society had always had so large a share.

A complete list of the specimens would be given later, but in the meantime Mr. Thomas gave the following account of the new forms* :—

Myotis myosotis ancilla Thos.

Abstract P. Z. S. 1910, p. 25 (April 26).

Smaller, with shorter ears, and more drab-coloured than in true *myosotis*.

Size rather smaller than in *myosotis*, not so small as in *blythi*. Ears decidedly smaller than in *myosotis*. General colour above nearly approaching "drab" of Ridgway, very different from the "wood-brown" of *myosotis* and its pale Persian subspecies *omari*. Head rather greyer. Dark shoulder-patches more strongly defined than in *myosotis*, blackish brown. Under surface as in *myosotis*.

Skull slightly smaller than in *myosotis*, and the bullæ smaller in correlation with the shorter ears. Protocone apparently as in *myosotis*, not as described by Miller in *blythi* †.

Dimensions of the type, the starred measurements taken in the flesh :—

Forearm 61 mm. (range 59 to 62).

Head and body *75 mm.; tail *56; hind foot *12; ear *21.

Skull: greatest length 22·2, basi-sinual length 17, front of canine to back of $m^3$ 9·2.

*Hab.* Shang-chou, S.E. Shen-si. Alt. 3300′.

*Type.* Adult male. B.M. No. 10.5.2.4. Original number 2082. Collected 27 November, 1909.

This is the eastern representative of the common European *M. myosotis*. What its relationship is to the Indian form *blythi* remains to be seen when better specimens of the latter are available for examination. But the type of *M. blythi*, received in the British Museum in the Tomes collection, is decidedly smaller.

Microtus (Eothenomys) nux Thos.

Abstract P. Z. S. 1910, p. 26 (April 26).

Darker than *M. inez*, with a longer and more distinctly bicolor tail.

General colour above decidedly darker than in *inez*, the back approaching "Prout's brown"; under surface also brown, of a slightly more buffy tone than the upper surface, but not sharply

* The complete account of the new species described in this communication appears here, but since the names and preliminary diagnoses were published in the 'Abstract,' No. 83, 1910, these species are distinguished by the names being underlined.—Editor.

† P. Biol. Soc. Wash. xiii. p. 155, 1900.

separated from it, the belly on the average decidedly browner than in *inez*. Head rather greyer. Hands and feet dull whitish or pale brown, averaging rather darker than in *inez*. Tail longer than in that species (average of 17 specimens 38 mm. as against 33 mm. in 14 *inez*), bicolor, dark brown or blackish above, dull whitish below.

Skull agreeing closely with that of *M. inez*, except that the posterior lateral palatal grooves tend to be deeper and more continuous, and thus to show an approach towards the single deep depression found on each side in *melanogaster*. Bullæ large, larger than in either of the other species.

Teeth on the whole most like those of *M. inez*, but showing an approach towards those of *melanogaster* by the junction of several of the enamel spaces, closed in the former, open in the latter. Thus in $m^3$ the normal 2nd and 3rd spaces, separated in *inez*, are joined as in *melanogaster*, and in $m_1$ the two spaces next following the trefoil are frequently joined to each other as in *Pitymys*. Small extra internal projection on $m^1$ and $m^2$ as in *M. inez*.

Dimensions of the type, measured in the flesh:—

Head and body 93 mm.; tail 39; hind foot 16·5; ear 10.

Skull: condylo-basal length 23·6 mm.; greatest breadth 14·3; nasals 7; interorbital breadth 4; palatilar length 11; diastema 6·5; palatal foramina 4·7; bullæ, diagonal horizontal diameter 7; upper molar series 5·6.

*Hab.* of type. Shang-chou; S.E. Shen-si. 3300′.

*Type.* Adult male. B. M. No. 10.5.2.79. Original number 2089. Collected 29 November, 1909. 23 specimens.

The discovery of this interesting species tends to confirm the reference of *M. inez* to *Eothenomys*, about which I had some doubt. For while *M. melanogaster*, the type of *Eothenomys*, has nearly all its cement-spaces communicating with each other, and *M. inez* has them nearly all closed and separate, the present form differs from *M. inez* exactly in the direction of *melanogaster* by the opening of several of the spaces, the great majority of them being still closed.

Microtus johannes Thos.

Abstract P. Z. S. 1910, p. 26 (April 26).

Near *M. mandarinus*, but rather smaller, with much smaller skull.

General characters very much as in *M. mandarinus*. Fur soft and fine; hairs of back about 11–13 mm. in length. General colour above rather browner than Ridgway's wood-brown, decidedly paler than in *M. mandarinus*. Under surface dull greyish; the hairs slaty basally, greyish white terminally. Ears short, projecting but slightly above the fur; practically naked. Upper surface of hands and feet dull whitish. Tail short, drabby whitish above, dull white below.

Skull broad and flat, very like that of *M. mandarinus* on a smaller scale. Brain-case square, with well-marked angles, but the ridges little developed. Anterior palatine foramina of about equal breadth throughout, those of *mandarinus* broad in front, narrowing behind.

Incisors markedly lighter than in *mandarinus*, their faces orange to the tips. Molar pattern about as in *M. mandarinus*; $m^3$ with 4 spaces, three outer and three inner salient angles; $m_1$ with 7 spaces, 5 inner and 4 outer angles. All triangles separated from each other except in $m_3$.

Dimensions of the type, measured in the flesh:—

Head and body 95 mm.; tail 23; hind foot 17; ear 7.

Skull: condylo-basal length 24·6 mm.; greatest breadth 15·2; nasals 7·0 × 3·1; interorbital breadth 3·5; palatilar length 13·2; diastema 7·1; palatal foramina 4·1; upper molar series (crowns) 5·8.

*Hab.* Mts. 12 miles N.W. of Ko-lan-chow, Shan-si. Alt. 7000′.

*Type.* Adult male. B.M. No. 9.1.1.178. Original number 1950. Collected 5 June, 1908.

This Vole was referred to *M. mandarinus* M.-Edw. in my last paper *, but by the kindness of Prof. Trouessart I have had an opportunity of re-examining the skull of that species, and I find it to agree in every detail with two specimens now sent from Shang-chou, S.E. Shen-si, and to differ equally from the Ko-lan-chow form, which therefore needs describing.

If, however, this identification be accepted, it throws some doubt on the asserted locality of "Mongolie chinoise" for *mandarinus*, and I think it not impossible that the type really came from S. Shen-si, where David made a small collection, after getting his Mongolian series.

*M. johannes* is readily distinguishable from *M. mandarinus* by its paler colour and markedly smaller skull.

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Mr. J. Lewis Bonhote, M.A., F.L.S., F.Z.S., exhibited a yellow variety of *Mus rattus*. This individual had been bred from two wild-caught examples of *Mus rattus tectorum* from Egypt. The long hairs on the upper parts, which are normally black, were colourless and the shorter body-hairs had grey bases with yellow tips. So far as he knew, this was the first recorded example of a yellow rat, which was a colour quite unknown to fanciers and was never met with by Crampe or Doncaster, who had conducted colour-breeding experiments on rats. Although it was not definitely stated, these experiments had probably been carried out with *Mus norvegicus*. A careful search through the large series of *Mus rattus* in the Museum also failed to bring to light any yellow forms.

* P. Z. S. 1908, p. 978.